

Keeping an Eye on Climate Change

Do you know the difference between “climate” and “weather”?

The weather is what you see outside right now—maybe cloudy and breezy or calm and sunny. Climate is like weather, except it covers a longer period of time—months, years, or even decades. It’s the type of weather you “expect” at a certain place at a certain time of the year.

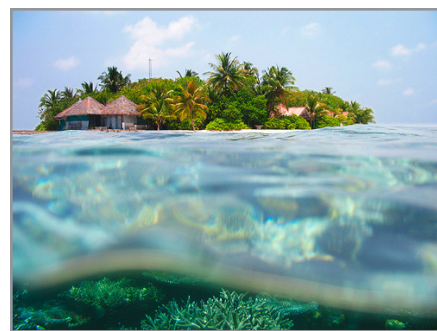
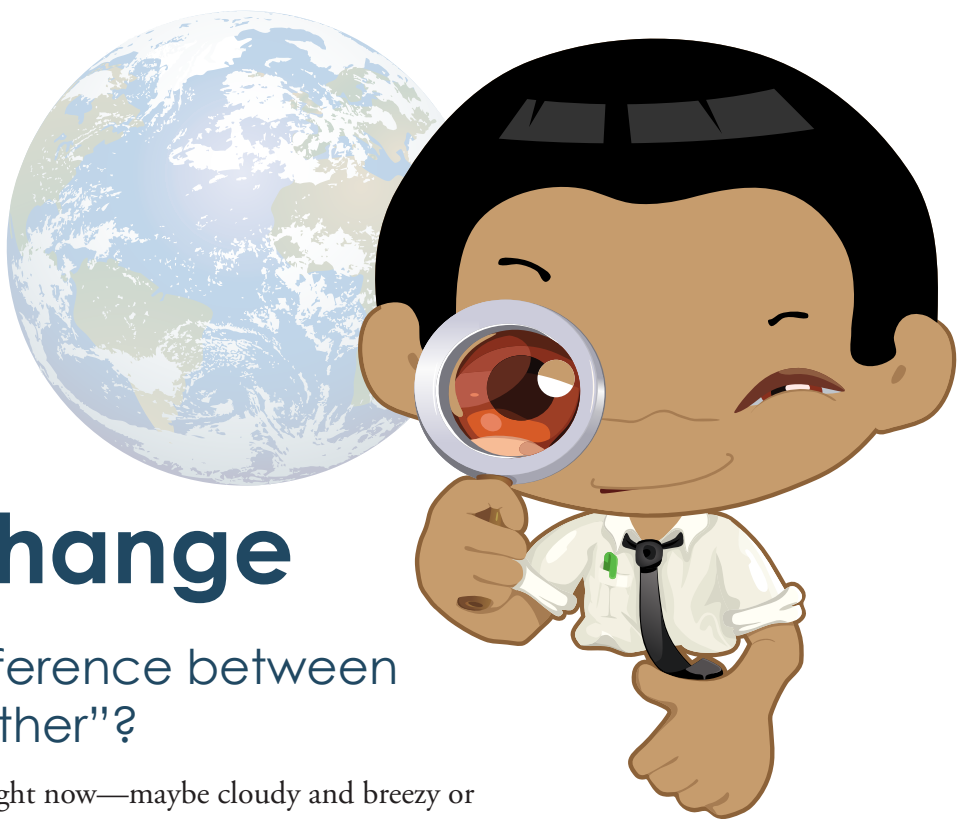
Climate is what you expect, but weather is what you get.

Does climate matter? Yes!

Earth is the only planet—that we know of—that can sustain life. This is because its overall climate is flexible enough to support moderate changes in temperature.

If Earth’s climate changes beyond a certain point, it may no longer be able to support all the different kinds of life that it does today. Even now, coastal communities are noticing higher tides that are destroying ecosystems along the shorelines.

Researchers from around the world use data gathered from the sky, sea, and Earth’s surface to study its climate and predict how it could change in the future.



Photos courtesy of Mohamed Abdulla Shafeeq, Maldives.

How do they get the data?

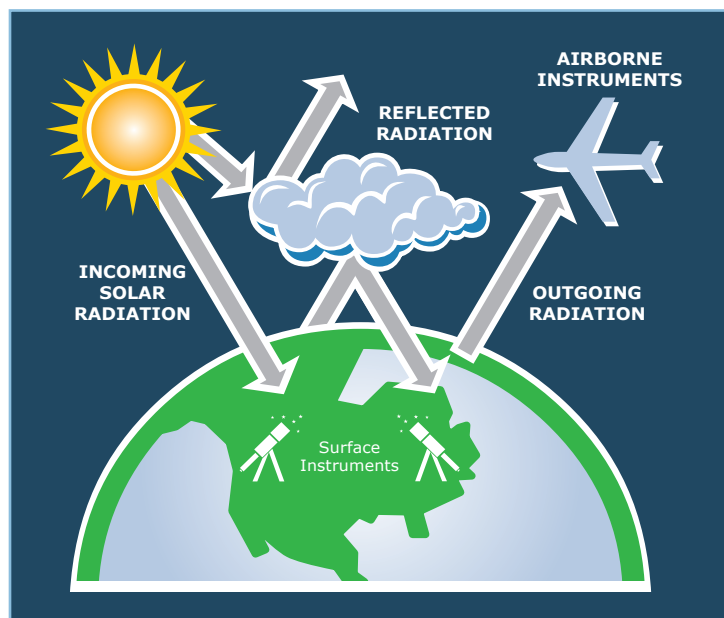
The U.S. Department of Energy (DOE) operates a handful of “outdoor laboratories” around the world that use lots of different instruments to monitor various elements of the climate, such as:

- Clouds – how big and thick and bright they are
- Aerosols – small particles in the air, such as soot, dust, and sea salt, that can grow into clouds
- Solar and thermal radiation – energy coming down from the sun and up from the Earth
- Basic weather components – temperature, pressure, humidity, and winds.

They also have two portable laboratories—the ARM Mobile Facilities—that can be moved around to obtain data from other places. One ARM Mobile Facility is operating on Gan Island between October 2011 and April 2012 for the **ARM Madden-Julian Oscillation Investigation Experiment, or AMIE**.



AMIE is part of a big international research effort among many scientific organizations in both the United States and South Asia. They're using planes, ships, and ground-based instruments to collect data from the Indian Ocean area. Scientists will use the data they collect to better predict how the MJO affects global climate.



What is the Madden-Julian Oscillation?

The MJO is a huge tropical weather system that starts in the Indian Ocean near the Maldives. As it moves eastward toward Papua New Guinea, it distributes heat and energy into the atmosphere before running out of steam in the mid-Pacific Ocean. This system reoccurs every 30-60 days throughout the winter months.

The MJO affects weather and rainfall in the tropical regions near the equator, but it also influences precipitation patterns and atmospheric circulation all around the globe.

To learn more about these studies, look for “AMIE” on the ARM website at www.arm.gov.



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